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ABSTRACT

At Northern Maine Technical College (NMTC), the mean age of students increased from 19.7 years in 1978 to 28.6 in 1991. In an effort to evaluate NMTC's nursing programs as perceived by traditional students (under 22 years of age) and nontraditional students (22 years of age or older), questionnaires were administered to 59 practical nursing students and 18 associate degree nursing students. An additional survey was developed and administered to 3 associate degree faculty and 10 faculty in the practical nursing program. The study sought to evaluate differences in teaching techniques by type of program, in teaching style by years of teaching experience, and in students' opinion of instruction by student age and cognitive style. While faculty in the associate degree program did not complete surveys, information on their years of teaching experience and instructional methods were obtained from data files and course syllabi. Study findings included the following: (1) no differences were found in the traditional teaching methods employed by practical and associate degree nursing faculty; (2) years of teaching experience did not correlate with teaching methods; (3) the preferred learning methods of traditional students did not differ from those of nontraditional students; (4) students' cognitive style (the means of processing information) did not correlate with preferred learning styles; and (5) the learning modality preferences of the two student groups were more similar than different. A literature review, data tables, the test instruments, and a 48-item bibliography are included. (PAA)

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A COMPARISON OF TEACHING LEARNING STYLES BY NURSING INSTRUCTORS AND NURSING STUDENTS AT NORTHERN MAINE TECHNICAL COLLEGE

Applied Educational Research and Evaluation

by

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A Practicum Proposal presented to Nova University in partial fulfillment of the requirements for the degree of Doctor of Education

Nova University

March 1991

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March, 1991

The mean age of students at Northern Maine Technical College (NMTC) has increased from nineteen and seven-tenths years in 1978 to twenty-eight and six-tenths years in 1991. The learning styles and preferred instructional methodologies of older students must be addressed if the college is to provide the quality instruction required to prepare citizens for employment in Maine's health-care arena and to function effectively in today's pluralistic society. The major purposes of this correlational study were to evaluate the instructional methods utilized in NMTC's nursing programs and determine how helpful these methods are for students' learning.

Fifty-nine practical nursing students and eighteen associate degree nursing students from NMTC served as the student subjects, and three associate degree faculty and ten practical nursing faculty from NMTC served as the faculty subjects. Two survey forms were used, one for faculty, the other for students.

Evaluation of teaching methods to type of program showed no significant difference between the traditional teaching methods of practical nursing faculty and of associate degree nursing faculty. Evaluation of faculty to methods of teaching and years of teaching experience showed no significant relationship between years of teaching experience and teaching methods.

Evaluation of students to preference for structure and traditional learning methods by age showed no significant difference between the learning methods of traditional (under 22 years of age) and nontraditional (22 years and older) students. Evaluation of students to preference for structure and traditional learning methods by cognitive level showed no significant relationship between cognitive level and learning methods of students.

Analysis of data supports the following conclusions: Wide differences in the preferred learning styles do not exist between NMTC's nontraditional and traditional nursing students. Nor do wide differences in the preferred learning methods of NMTC's nursing students with different cognitive levels exist although students with more abstract cognitive levels appear to prefer student-centered learning activities slightly more than do students with concrete cognitive levels. Data presented supports the position that such groups of students are more similar than different in their preference for learning modalities.

It is further concluded that wide differences in teaching techniques do not exist between NMTC's PN and ADN faculty. Nor do wide differences in teaching style exist between NMTC's nursing faculty relative to years of teaching experience.

It is recommended that the unique learning styles of individual nursing students be the foundation of instructional methodologies rather than the presumed needs of various groups of students. A variety of teaching/learning activities should be implemented in NMTC's nursing programs in an effort to meet the unique needs of all students. Nursing faculty should be cognizant of the need for structure while encouraging and promoting self-direction and autonomy, as this is a highly desired attribute for nurses. This can be accomplished by techniques that incorporate independent study, and self-paced, learning methods.

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Chapter 1

INTRODUCTION

Background and Significance

Northern Maine Technical College (NMTC), is one of six colleges in the State of Maine offering vocational and technical programs required by citizens for employment in business, industry and government within the State. Demographic studies at NMTC show a dramatic increase in the enrollment of students aged twenty-five to forty-four, with a concurrent decrease in the enrollment of eighteen to nineteen year olds. The median age of students at NMTC has increased from nineteen and seven-tenths years in 1978 to twenty-eight and six-tenths years in 1991.

The literature is rich with discussions about the different learning styles and preferred instructional methodologies of the older student, yet the lecture method of instruction is used almost exclusively in NMTC's nursing programs. Faculty are subjecting adults to learning environments based on how children learn. Faculty do not know what instruction techniques work best with adults, nor how to tap their life experiences to help them relate to the instructional material.

There is a pressing need at NMTC to compare the instructional and learning techniques of teachers and

students to ascertain whether the needs of nontraditional nursing students are being met. Additionally, NMTC has a need for clarification in the area of teaching-learning techniques in order to improve professional development planning for nursing faculty.

The purpose of this study is to evaluate what instructional methods are utilized in NMTC's nursing programs to see how helpful students believe these techniques are for their learning. The specific objectives of this project were: (1) to evaluate the different types of teaching techniques used by instructors by type of program; (2) to evaluate teaching style by years of teaching experience; and (3) to evaluate the student opinion of instruction by age and by cognitive level.

NMTC must fulfill its promise to the community, the region, and the State by graduating students who are fully prepared to function effectively in today's health-care arena and pluralistic society. This can only be accomplished if faculty discover what motivates adult learners and understand what instruction techniques work best with adults.

Conclusions protracted from the literature providing the foundation for this study include the following: Principles of adult development should be a prime consideration when determining the teaching/learning needs of adults; the learning needs of nontraditional students are

an individual matter, and must be tailored to the concerns, expectations and backgrounds of students; technical college faculty are not prepared to teach adults; pedagogical skills and knowledge are inadequate for meeting the needs of adult learners; adult educators require a firm foundation in andragogy; effective instructional techniques for adult learners include peer review, critical incidents, experiential learning, competency-based education, and teacher/student partnerships; the increase in nontraditional students entering nursing programs will pressure schools to respond to students' needs and demands; and lastly, alternative evaluation systems and learning environments are needed as well as new instructional methods.

This practicum related to the "Applied Educational Research And Evaluation" seminar which focused on the concepts of the problem-solving methodologies. The concepts of educational research were applied to a perceived problem in the teaching/learning environment of NMTC's nursing programs, and the influence of educational policy and practice was described during the course of the study.

Research Questions

The questions for this correlational study were: (1) Are the instructional methods used by faculty in the practical nursing program more structured and traditional than those methods used by faculty in the associate degree

nursing program? (2) Are the teaching methods of experienced faculty more structured and traditional than the teaching methods of less experienced faculty? (3) Are the preferred learning methods of nontraditional students more unstructured and nontraditional than the learning methods of traditional students? (4) Do students with more concrete cognitive levels prefer more structured and traditional teaching methods than students with more abstract cognitive levels?

Hypotheses

The hypotheses for this study were as follows: (1) There will be no significant difference between the mean teaching method scores of the practical nursing and associate degree nursing faculty; (2) There will be no relationship between faculty's teaching method and years of teaching experience; (3) There will be no significant difference between the mean learning method scores of traditional (under 22 years old) and nontraditional (22 years or older) students; (4) There will not be a significant relationship between cognitive level scores and learning method scores of students.

Chapter 2

LITERATURE REVIEW

Adult Learning Theories/Principles

Various researchers, including Jung, Buhler, Erikson, and Havighurst, have formulated sequential models of adult development. More recent investigators, such as Levinson, Gould, and Sheehy have formulated age-related sequential models of adult development that view the various stages of adulthood in terms of different strategies toward perceiving and coping with reality. In addition, several theorists have postulated models of adult development with a special focus, for example, Loevinger's concentration of stages of ego development, Perry's scheme of intellectual development, Kohlberg's notion of the interconnection between levels of moral and intellectual development, and Fowler's theory of faith development. Many of the findings of such research and examination of human development have important implications for adult education.

The concept of "andragogy," which was conceived by Knowles, forms the underlying principles for adult basic education (ABE) preservice and inservice training programs. Knowles identified the following five focal points that he felt should be considered by adult educators: self-concept, experience, readiness, time perspective, and orientation to learning (Burley, 1985). Adult learning theory (Knowles,

1980) suggests that adult learners are characterized by the ability to be self-directed, have past experiences that serve as resources for future learning, are interested in immediate applicability of learning within a problem-solving framework, and are ready to be actively involved in increasing their competence to perform adult roles and tasks. Developmental psychology, particularly cognitive psychology, has provided the springboard for several adult learning models.

Kember and Murphy (1990) offer a paradigm for teaching adult students which is based on cognitive psychology. These authors believe that:

> For meaningful and lasting learning to occur, greater attention should be given to the constructivist paradigm, and specific techniques need to be devised and implemented which encourage deep learning in our students (Kember and Murphy, 1990:45).

Squires' contingency model postulates that the how of teaching is determined by the nature and characteristics of the participants (the who), the content (the what), and the setting (the where) in which teaching takes place. In contrast, the noncontingency model postulates that, irrespective of the aforementioned factors, teaching must adhere to fundamental principles or laws relating to the nature of learning itself. Although Bright (1986) believes that these models have given rise to many models and theories of adult development and learning, myths continue to abound about adult learning.

Karmos and Greathouse (1989) refute myths about adult learners and call for empowering education based on the principles that adults (1) can learn a lot, (2) demand solid content, (3) want to learn something new, and (4) guard their self-esteem. According to Knofla (1989) and others, (for example, Bents and Howey, 1981) theories of life cycle phases, adult development, and adult motivation to learn provide a basis for planning and developing campus activities to attract the attention of this market. An exorbitant amount of literature addresses learning styles in relationship to an individual's locus of control.

Locus of control refers to a person's beliefs about control over life events (Rotter, 1982). Some people feel responsible for, or in control over the things that happen to them (internal control) whereas others feel that the outcomes in life are determined by forces beyond their control (external control) such as fate, luck, and powerful others.

The locus of control construct has generated numerous studies among a variety of populations (children, college students, males, females, minorities) as well as various investigations involving nursing students (for example, Levine, 1978; Sanchez, 1983). Tomaselli (1975) intended to determine how nursing students who elected independent study differed from those who chose to remain in traditional lecture classes. Those in independent study were

significantly more internal. Other theorists would prefer to think that the preference for structure verses less structure in one's learning environment is based on the type of information processing that occurs naturally in the human brain.

Research into human brain processes has clearly shown the existence of two distinctly different modes of thought. These two modes are associated with the physical division of the brain into the left and right hemispheres. Left-brain thought processes show up as statements oriented to logical reasoning, elements, sequences, facts and figures, and conceptual structures. Right-brain thought processes show up as statements about people, feelings, experiences, patterns, relations, and philosophical concepts (Albrecht, 1983). "It is clear that most people learn to favor one of these two thinking modes (logical and intuition) over the other as they grow up and develop into adults" (Albrecht, 1983:12).

Albrecht believes that the tendency to rely on one predominant mode for the majority of one's thinking processes points to the concept of cognitive style as a framework for understanding how someone thinks, learns, communicates, and decides. This mode preference is one of the two dimensions of thinking style, the dimension of structure. The other dimension of thinking style deals with what a person thinks. Here the contrast is between concrete

thinking and abstract thinking. Albrecht developed MINDEX, a self-assessment instrument, which is an application of knowledge about human information processing that diagnoses thinking style or cognitive style. Cognitive research on the adult learner indicates that the ability to make abstract judgements may increase with maturity (Knox, 1980).

Based on the above theories and principles, it can be concluded that nontraditional students may exhibit learning characteristics related to self-directedness, resources of past experiences, and independence in the learning situation, that is, less need for structure. Furthermore, a student's locus of internal/external control and natural tendency to use the right or left hemisphere of the brain during normal thought processes are factors that probably should be taken into consideration when determining the learning needs of students. Of all the literature covering the subject of the older student, of critical importance is the area of instructional delivery.

Current Thinking on Teaching Adults

According to the American Association of Colleges (1988), at two-year schools, older students comprise forty percent of enrollment. The special needs and concerns of this population of students cannot be ignored. Jacobs (1989:70) contends that

> many community-college teachers tend to approach supplementary technical training as they would traditional vocational education for students just out of high school. But what might be good for 18-year-olds looking for entry-level jobs is not appropriate for people in their mid-thirties. Baldwin

and Wasiluk (1988:59) reaffirm this thinking when they say "most adult educators have not been taught how to teach adults and revert to teaching the way they were taught." Mitchell (1988:186) states that "the typical nursing student is older than before and that nursing education programs must develop educational alternatives that address students' needs and learning styles." In the State of Maine, the Governor has made the education of adults a top governmental concern.

In the Productivity Imperative and the Maine Economy (1990) the charge is to the State's higher education institutions to more rapidly adopt changes in focus and structure that will allow them to serve the emerging needs of both Maine's traditional and nontraditional students. Many educators believe a restructuring effort of the entire educational system is necessary.

Apps (1989:23) suggests that "the future of adult education depends on reexamining assumptions, redefining adult educator, creating new structures, deepening and broadening the purpose, developing cooperative relationships, and abandoning defensive postures." Along the same line of thought, Knox (1989:47) asserts that

> if educational programs for adults are to have greater impact and fulfill their promise, more attention must be given to comprehensive programs and their potential for achieving major benefits for organizations, communities, and society.

Writings vis-a-vis the learning styles of adults has become very popular in the last decade.

Baldwin and Wasiluk (1988:63) note that "adult learning is a very private matter occurring within the individual's mind. It is the individual adult who has total control over whether anything is learned." Other authors write about the needs of the part-time adult student. Ottaway (1989:61) says that "engaging adult students who are part-time learners requires a paticular effort to integrate academic learning with the rest of their lives."

MacFarland (1985:1) contends that "vocational educators must develop new approaches and new attitudes to prepare to serve an older student audience." MacFarland has developed a seven-step model based on Knowles's theory of andragogy. The parameters of the model are as follows: establish a climate conductive to adult learning, create an organizational structure that allows participative planning, diagnose learning needs, formulate appropriate learning objectives, design and implement appropriate learning activities, and evaluate for rediagnosis of learning needs.

Other authors recommend competency-based education for adult learnerns (for example, Davis, 1985). Heimstra, 1985, on the other hand, makes a case for self-directed modules

for adult learners, while Kelly (1986) argues for learning contracts, structured inquiry, competency-based education, and experiential learning in addition to self-directed learning. Long (1989) also discusses the need for educators to apply principles for developing self-direction in adult learning, noting that adults are self-motivated, that is, they are committed to achievement in the field of their choice.

Usova and Casteen (1986) suggest that an understanding of the educational value of using questions appropriately is essential for educators. Many authors discuss the need for educators to see themselves as facilitators of an adult student's learning, reminding educators to remember the context of their work (for example, Copa and Sandmann, 1987).

Schneider (1989) makes a case for peer review when teaching adult students, especially with adults in transition, particularly women. Barker (1989) suggests a teaching strategy devised to introduce adult students to the formalities of contextual analysis and multiplicity thinking and designed to get them to see that phenomena can be described from several points of view simultaneously and each description has validity. This strategy is designed to ease the anxiety of adult students.

Experiential learning is a central issue in adult learning. Harris (1989) explores several aspects of

experiential learning and how it can be used by adult students. Harris suggests further examination of the impact of experiential learning on academic performance and of strategies students can use to capitalize on it.

The value of experience to the adult learner is also discussed by other authors (for example, Shinn, 1988), and teacher-student partnerships is surfacing more frequently in the last few years (for example, Dannerbeck, 1987). Critical incidents is another concept that is becoming more popular in the educational literature.

"Practice what you preach, use critical incidents to teach adult students" (Lagravier and Beatty, 1985:1) is the answer to the learning needs of adults according to some educators. The critical incidents method is an instructional method that draws upon recognized principles of adult education. The strategy actively involves participants by capitalizing upon their experience, thereby making possible the application of new insights and behaviors to a relevant practice setting and ensuring relevancy to the learners' situations (Lagravier and Paulette, 1985). Few studies have actually looked at the effectiveness of the application of adult learning theory and principles.

Dyer (1985) believes there is a gap between the beliefs in adult education and what is promoted to the practitioner. In essence, Dyer thinks that although much is known about

adult learning and techniques for teaching adult students, it is not known what impact this knowledge has on the effectiveness of an adult educator.

Harrell (1987) conducted a study to identify teaching strategies that may be used by nursing faculty in teaching middle-aged and older nursing students at Long Beach City College. The teaching strategies that were found to be the most helpful to the learning of this population of students are as follows: lecture, discussion, inquiry, role playing, group process, and outside activity.

Mickler, and Zippert (1987) conducted a study of the effect of adjusting teaching methods to coincide with the learning preferences of students enrolled in a small, predominantly Black, community college. The study revealed that students in the group where teaching strategies matched learning styles had higher achievement gains than students taught with the lecture method.

Sweeny (1988) reminds educators that adult learners require changed delivery methods and she predicts that delivery methods will and should continue to change in universities and colleges. The influx of older students into traditional university and college classes appears to be prompting some faculty members to take a new look at the way they teach. Faculty facing classrooms of students with an age mix from eighteen to sixty-five seem to be finding that they may need to abandon traditional instructional

delivery methods such as the lecture, and adopt more engaging andragogical styles.

Some authors discuss the need for a non-authoritarian learning environment for nontraditional students and a more authoritarian or directive climate for traditional students (for example, Parker, 1988). Along the same vein, Erickson, (1989:1) states that "pedagogical approaches, which treat students as empty vessels into which knowledge is deposited, are inappropriate for teaching adults."

Research Findings on Learning Style

The numbers of nontraditional nursing students are increasing every year, especially in community colleges, and teaching methods must be tailored to their particular backgrounds, needs, and expectations (Woolley, 1973). Unfortunately, the literature generally reveals little research on adult learners' preferred methods or styles of learning new materials, although it is suggested that teaching strategies should be directed to their past life experiences.

A few studies have substantiated the notion that learning needs of students vary with age. For example, Curran (1977) administered a questionnaire to 800 registered nurses in Illinois and the results indicated significant differences in identified learning needs and participation in continuing education according to characteristics such as

age, income, nursing program, and employment position. Learning style is but one difference between adult learners and traditional learners.

Clark, (1989) summarizes the following differences between adult learners and more traditional college age students: (1) chronology; (2) developmental progression; (3) motivation; (4) learning style; and (5) intellectual development. Even (1988:29) adds that:

> When adult learners come to the learning program, they bring the individual `baggage' that they carry around - such as home problems, time constraints, employment problems, and positive or negative feelings about self. The baggage of an adult's life contains all that adults are, have been, and hope to be, as well as all that life means to them.

The baggage that nontraditional students bring to the university/college with them has significant implications for student retention.

The faculty at Quo Vadis School of Nursing in Ontario conducted a five year study of nursing students aged thirty to fifty to determine problems of adjustment. It was found that students who had been highly mobile were found not to adjust to the nursing school as expected. Age was the least significant variable studied; and marital status seems to be a crucial variable. Those students who had had post-secondary education in the area of health adjusted well and were self confident. The middle I.Q. group adjusted better than the low or the high (McLean, and Lucas, 1970).

Seidl and Sauter (1990:13) conducted a study "to compare traditional and nontraditional nursing students in

order to dispel myths and to develop policies and educational strategies." These researchers found that nontraditional students were an excellent risk for admission, having higher semester grade point averages and being more skilled in making professional judgements. Learning style differentiated traditional and nontraditional students, however, teaching methods were similar. In contrast, Linares (1989:354) conducted a study to compare younger generic nursing students to registered nursing students returning to school, and found that no differences existed for the three constructs - locus of control, self-directed learning readiness, and learning style preference.

In a similar study by Merritt (1983), the Kolb Learning Style Questionnaire and the Canfield Learning Style Inventory were administered to 343 nursing students in six baccalaureate programs. Of these students, 216 were generic (traditional) students and 127 were RN (nontraditional) students. The study sought to determine the relationship of age, and professional nursing employment experience to learning style preferences of generic and RN students. The age of generic students and the age and work experience of RN students did not account for differences in students' learning styles as measured by either instrument. The results of this study for both generic and RN students did not support the propositions that age or length of career

employment account for the variations in the manners in which adults prefer to learn.

Also looking at generic and RN students, King (1984) examined adult developmental patterns in generic (traditional) and RN baccalaureate (nontraditional) nursing students along with the relationships of adult development to the educational process. The results of the study revealed that significant differences between generic and RN students with respect to their life stages and ego development existed, but not with respect to their learning styles.

In a study with similar findings, Johanson (1988), examined learning styles of generic and RN students, and found there were no significant relationships between generic and RN students and learning style. This was also true for the variables of age, full or part-time enrollment, or experience in the health care field.

It would appear that research findings, although not exhaustive in this review, are disparate where the learning styles of traditional and nontraditional nursing students are concerned. Nonetheless, there is ample evidence that faculty need to examine their own learning/teaching styles in terms of how that relationship might facilitate or frustrate an effective learning environment for students.

Conclusions

The literature indicates that principles of adult development should be a prime consideration when determining the teaching/learning needs of adult students. The learning needs of nontraditional students are an individual matter, and must be tailored to the concerns, expectations and backgrounds of students.

Faculty are not prepared to teach adults. Pedagogical skills and knowledge are inadequate for meeting the needs of adult learners; adult educators require a firm foundation in andragogy. Effective instructional techniques used by enlightened adult educators include peer review, critical incidents, experiential learning, competency-based education, and teacher/student partnerships.

Lastly, it may be anticipated that the increase in nontraditional students entering nursing programs as well as the college/university at large will be pressuring the schools to respond to their needs and demands. New methods for delivering instructional content may need to be considered as well as alternative evaluation systems and learning environments.

Chapter 3

METHODOLOGY AND PROCEDURES

This research project was a correlational study. Two survey forms were used, one for faculty, the other for nursing students. The teacher form and the student form are in Appendix A. The permission letter to use the student form and teacher form is in Appendix B.

The procedures used to complete the study are as follows: A search of appropriate literature was conducted to provide a framework for the study. A researcher who conducted a similar study on Maine Vocational Technical Institutes in 1977-78 was contacted for information and advise relative to the study. Input was also solicited from Nova University's Programs For Higher Education research advisor. Although these procedures were not identified in the research proposal, the investigator determined that input from expert researchers would enhance the accuracy of research methodology and procedures.

Fifty-nine practical nursing students, eighteen associate degree nursing students, and ten faculty completed the survey forms. Three practical nursing instructors chose not to complete the teacher form. Data relative to the years of teaching experience and instructional techniques of these three instructors were readily obtained from the Maine

Teacher's Association seniority list and the practical nursing program syllabus, respectively. These three instructors acknowledged that they rigidly followed the instructional techniques outlined in the aforementioned syllabus, therefore the data were used with confidence. The faculty sample remained at thirteen, as planned.

Five practical nursing students and one associate degree nursing student exited the program, and two practical nursing students were absent the day the surveys were administered, reducing the planned sample from eighty-five to seventy-seven nursing students. The sample of students and faculty represented the total number of nursing students and nursing faculty at NMTC with the exception of the two students absent that day.

The survey forms were administered to students by the investigator in the practical nursing program and by a faculty member in the associate degree nursing program during regularly scheduled classes, after explaining the goals of the study. The survey forms were adminstered by the investigator to faculty during a regularly scheduled weekly faculty meeting, after describing the goals of the study. The forms were completed by all participants on a voluntary basis. Although the research proposal did not indicate the surveys would be completed by participants on a voluntary basis, the investigator determined that participants would be less threatened if the voluntary condition was introduced.

The teacher survey was developed by Drummond and Sutton (1978) for use in a government research study of the Maine Vocational Technical Institutes conducted under Part C of Public Law 90-576. The survey contained twenty-one types of teaching or instructional techniques commonly used in the technical colleges. The instructors were asked to indicate the frequency in which they used each technique on a four point scale from not used to frequently used. The teaching techniques on the teacher form were assigned one point for "not used," two points for "seldom used," three points for "moderately used," and four points for "frequently used." The teaching methods - lecture, teacher-led discussion, homework, and written exams - were considered to be unstructured and nontraditional teaching methods. A score of at least twelve out of a possible score of sixteen on the structured and traditional teaching methods section constituted a structured and traditional teaching style and a score of less than twelve on this section constituted an unstructured and nontraditional teaching style.

There was space alotted for instructors to add additional techniques not listed. There were three open-ended questions included. The first asked instructors to list in order of effectiveness the teaching techniques which have been most successful for them to use with students, where the students have learned effectively and they (the teachers) have been pleased with the results.

They were also asked to describe a specific illustration of one of their successful teaching experiences. The third question asked them to describe new or innovative methods they were using to teach a course(s). This information will be used in a future study.

Part one of the student form consisted of eight demographic questions such as type of nursing program and age. Part two of the student form, the Ways of Learning Inventory, was factor analyzed by the developers to identify the structure of the instrument. Eleven factors were extracted and accounted for fifty-three and seven-tenths percent of the variance. The items on part two of the student form were developed to reflect the teaching methods used in Maine's vocational technical institutes and to correlate with the items on the teacher's scale.

There were thirty-nine items describing teaching learning techniques on which the students were asked to rate them on how helpful that particular technique was in assisting them to learn. Students were asked to respond to each item on a five point scale from "hinders or prevents learning" to "is extremely helpful." If the student scored twenty-one or higher out of a possible thirty points on the six traditional learning methods of the thirty-nine learning methods listed, the student was considered to prefer traditional and structured learning methods. The six structured and traditional learning methods were: taking a

written test, listening to the teacher talk about a topic, doing homework assignments, reading assigned textbooks, answering the questions the teacher asks, and listening to guest lecturers.

Two open-ended questions were also asked: The first, what other learning styles were helpful to them and the second, what was the most effective and efficient learning style for them. The items on the scale reflect the techniques used in Maine's technical colleges and correlates with the items included on the instructor's scale.

Part three of the student form was Albrecht's (1983) MINDEX. MINDEX has 100 carefully formulated statements that deal with various aspects of an individual's thinking process. On the small blank line provided beside each statement, the participant writes a number ranging from one to five depending on the extent to which he/she feels the statement applies to him/her. The ratings range from not at all to to a very great extent. Each statement is considered strictly on its own merits, without regard to other statements or other factors. If a high rating is given to one statement, that does not prevent the giving of a high number to any other statement. The participants were told to avoid the "middle of the road" choice according to "Instructions for Answering MINDEX," outlined in the instrument (Albrecht, 1983:2).

The MINDEX instrument has a face validity rating of

four on a five-point Likert-type scale. Albrecht (1986) reports that he has used MINDEX in countless workshops and team-building sessions, as have many other MINDEX users. People all over the U.S. as well as in countries as far away as Australia, Saudi Arabia, Africa, Norway, Sweden, Denmark, Canada, and South America. Albrecht and Associates are accumulating and analyzing an international norm base of profiles which will soon be available to MINDEX users.

The data were analyzed with an IBM PC using GB-STAT, version 2.0 by Dynamic Microsystems, Inc. using descriptive and inferential statistics. Evaluation of teaching methods to type of nursing program was determined using a t-test. Evaluation of faculty to methods of teaching and years of teaching experience was completed by use of Pearson's correlation and the t-test. A chi square test could not be used as planned because the resulting data did not meet the criteria for using a chi square. Evaluation of students to preference for structure and traditional learning methods by cognitive level was determined using the Pearson product moment correlation and the t-test. Level of significance for each statistical test was set at .05.

Definitions

The following definitions are provided to eliminate confusion on the part of the reader. Cognitive style is the

way in which an individual organizes and processes information; cognitive style and thinking style are used synonymously. Learning style is the way in which one gains knowledge and/or skill. A nontraditional student is one who is twenty-two years of age or older, and a traditional student is a student aged seventeen to twenty-one years. The adult student, the older student, and the nontraditional student are terms used synonymously in the study.

Assumptions

An assumption was made in this study that nursing students' perceptions of their teaching/learning needs accurately reflect their true needs. A second assumption is that if an individual's cognitive style is known, the most effective learning style for the individual is also known.

Limitations

One of the limitations of this study involved the sampling procedure. Since a random sampling technique was not used, the geralizability of the findings are limited. A second limitation is that there is no guarantee that students/faculty expressed their true thoughts and feelings. Extraneous variables such as the SES, locus of control, work experience, educational background, and ethnic status of subjects were not known. To the extent that groups of subjects were similar on these variables, credibility in the internal validity of the study would be enhanced.

Chapter 4

RESULTS

The demographic data revealed that the age of the student samples ranged from eighteen to fifty-three years, with a mean age of thirty and two-tenths years. Seventeen students were under twenty-two years of age, therefore were considered to be traditional students. Sixty of the nursing students were twenty-two years of age or older, therefore were considered to be nontraditional students. All student and faculty subjects were female.

The null hypothesis that there would be no significant difference between the mean teaching method scores of the PN and ADN faculty could not be rejected (Table 1, A&B). Refer to Figure 1 (A&B) for histograms of the traditional and the nontraditional teaching style percentage scores of the nursing faculty as a whole. Figure 2 (A&B) depicts a visual comparison of the traditional and the nontraditional teaching style percentage scores of PN and ADN faculty. The ADN faculty do show slightly greater use of nontraditional teaching methods than the PN faculty.

The second null hypothesis that there would be no relationship between faculty's teaching method and years of teaching experience could not be rejected (Table 2, A&B). However, Pearson's correlation did show a slight negative correlation between traditional teaching method and years of

teaching experience, indicating that the longer one teaches, the less traditional are the teaching methods used.

Faculty with zero to three years of teaching experience and faculty with four to ten years of teaching experience show no significant difference in their teaching styles. In comparing faculty with four to ten years of teaching experience and faculty with eleven to twenty-five years of teaching experience, no significant difference existed in teaching styles. Lastly, a comparison of faculty with zero to three years of teaching experience and eleven to twenty-five years of teaching experience showed no significant differences in teaching style.

The third null hypothesis that there would be no significant difference between the mean learning method scores of traditional and nontraditional students could not be rejected (Table 3, A&B). Figure 3 (A&B) depicts the traditional and the nontraditional learning style percentage scores of the traditionally aged students and the nontraditionally aged students. Pearson's correlation showed a slight positive correlation between traditional learning style and age. That is, the older the student, the more the student learns by traditional methods. There was a slight negative correlation between nontraditional learning style and age. That is, the older the student, the less likely it is that the student learns by nontraditional methods.

The fourth null hypothesis that there would not be a significant relationship between cognitive level scores and learning method scores of students could not be rejected (Table 4, A&B). Pearson's correlation shows a slight positive correlation between students' abstract cognitive level scores and traditional learning style scores. In addition, there was a slight positive correlation between students' abstract cognitive level scores and students' nontraditional learning style scores, indicating that as abstract cognitive level increases, preference for both traditional and nontraditional learning methods increase.

A t-test shows a significant relationship between traditional learning method scores of students and abstract cognitive level scores of students. That is, the more abstract students thinking styles are, the more they learn by traditional learning methods. Although significant only at the .10 level, a t-test also shows a relationship between nontraditional learning method scores of students and abstract cognitive level scores of students. This finding is consistent with the one above using Pearson's correlation, indicating there is an increased preference for both traditional and nontraditional learning methods by students with higher abstract cognitive levels. Figure 4 (A&B) shows the traditional learning style percentage scores and nontraditional learning style percentage scores of students based on cognitve level (abstract or concrete).

Chapter 5

DISCUSSION, CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS

Discussion

The fact that demographic data revealed the mean age of nursing students to be thirty and two-tenths years is consistent with national trends (Linares,1989:356). Seventy-eight percent of the student subjects were between the ages of twenty-two and fifty-three. This evidences current trends whereby more older female students are continuing their career preparation where it was dropped at the time of marriage or motherhood (Baj, 1985).

The research hypothesis that the PN faculty would be more structured and traditional in their teaching methods than the ADN faculty was not supported. However, the fact that there was not a significant difference between the teaching method scores of PN and ADN faculty could be impacted by the samll sample size of the ADN faculty in comparison to the larger number of PN faculty. The ADN faculty did show a slightly greater use of nontraditional teaching methods than the PN faculty. It should be noted that ADN students have more to offer during group study than PN students relative to work experience in nursing because

the ADN students are all licensed practical nurses with substantial clinical experience. It should also be noted that the educational background of the ADN faculty is at a minimum of a master's degree in nursing whereas the educational background of the PN faculty ranges from a diploma to a certificate of advanced study. Typically, the ADN faculty are more active than the PN faculty in professional development as it relates to the education of nursing students.

The research hypothesis that the more teaching experience an instructor has, the more structured and traditional their teaching will be, was not supported. Actually, this study suggests that the longer one teaches, the less traditional and structured one's teaching becomes. Whether a teacher becomes more confident and comfortable in the classroom with increased experience thus allowing for more flexibility in teaching style was not addressed in this study. If the teacher is less influenced by peer pressure with increased teaching experience is also not known. This finding is not consistent with findings reported in the literature review.

The third research hypothesis that nontraditional students will prefer less structure and traditional learning methods was not supported. It was found that there is a slight positive correlation between traditional learning style and age and a slight negative correlation between

nontraditional learning style and age. This finding is inconsistent with most findings reported in the nursing literature. For example, Curran (1977), Clark (1989), and Seidl and Sauter (1990) found that significant differences did exist in the the learning styles of traditional and nontraditional students.

In contrast, as the review of literature suggests, some findings do support the findings of this present study by suggesting that no differences exist between the learning styles of traditional and nontraditional students, for example, Linares (1989), and King (1984). In fact, Linares (1989:358) found that

> both generic and RN students express a strong preference for teacher-structured learning (with almost identical scores), indicating preference for learning in well-organized teacher-directed classes where expectation, assignments, and goals are clearly identified.

Linares's (1989) findings were comparable to the results of Merritt's (1983) research.

Overall, both groups of students (traditional and nontraditional) indicated a strong preference for learning concrete, specific, practical tasks with a preference for well-organized, teacher-directed classes. The educational literature indicates that students coming back to school after many years expect to be taught the way they were taught when they were young. The present findings support this notion.

The fourth, and last, research hypothesis that the student preference for structured and traditional teaching methods would decrease as cognitive level (concrete to abstract) increased, was not supported. Students with abstract cognitive levels indicated a slightly stronger preference than students with concrete cognitive levels for nontraditional (less-structured) modes of learning. Thus, although the difference was statistically insignificant, there was a tendency for students with abstract thinking to indicate what is sometimes considered in the literature as "a more adult learning orientation" than students with concrete thinking styles.

Conclusions

The findings of this study did not support the premise that wide differences in learning characteristics exist between NMTC's nontraditional and traditional nursing students. Nor do wide differences in learning characteristics exist between students with abstract and concrete cognitive levels. Evidence presented supports the position that such groups of students are more similar than different in their preference for learning modalities. Although individual variations were found, these individual differences could not be attributed to group membership.

The findings of this study did not support the notion that wide differences in teaching techniques exist between

NMTC's ADN and PN faculty. Nor do wide differences in teaching style exist between NMTC faculty relative to years of teaching experience.

Several conclusions were made based on these findings. Both traditional and nontraditional nursing students indicate a strong preference for a teacher-structured instructional situation. This finding suggests that the instructional methods used by NMTC's nursing faculty are meeting the needs of students.

Students with abstract thinking styles and students with concrete thinking styles prefer a teacher-structured instructional situation. Students with abstract thinking styles indicate a slightly stronger preference for unstructured instructional situations than do students with concrete thinking styles. This finding indicates once again that NMTC nursing faculty are meeting the needs of students, because although teacher-structured instructional techniques are generally used by faculty, unstructured instructional techniques are being introduced often enough to meet the needs and preferences of students with abstract cognitive levels. The fact that the majority of NMTC's nursing students have concrete thinking styles further reinforces this conclusion.

Both ADN and PN faculty use predominantly teacher-centered instructional techniques although ADN faculty use student-centered instructional techniques more

frequently than do PN faculty. There was no indication that ADN faculty should use unstructured teaching methods more often than PN faculty, therefore, it appears that no change is needed in teaching methods with the current population of nursing students.

Regardless of the years of teaching experience, NMTC nursing faculty use the teacher-centered instructional situation almost exclusively. This style of teaching may be encouraged by peer pressure and/or from the curricular requirements of nursing's accrediting agency. Perhaps young instructors role-model the more experienced instructors and are more reluctant to venture into unchartered territory where the instructional situation is concerned. Whatever the reason, it can be concluded from the findings that teachers at NMTC for the most part are meeting the learning needs of the majority of nursing students in both the ADN and PN programs.

Implications

The major implication of this study is that the best methods for teaching older students are the best methods for teaching all students. Perhaps too much attention is being focused on instructional techniques for various groups of students rather than identifying the unique needs of individual students.

Educators have only begun to understand cognitive style even though the concept has been discussed for some time.

Over time, learners do develop a learning style that stresses one learning mode over another (Brudenell and Carpenter, 1990:81). If a student's learning style is understood then the instructor can design and implement teaching strategies that will meet the individual needs/concerns of students.

The assumption is often made by some educators who have studied teaching methods at the elementary, secondary, and post-secondary levels, that learning in a cooperative context with other students is more effective than the traditional lecture model. The assumption may well be a valid one, however, the perception on the part of students, or at least on the part of adult students, suggests that students believe they learn best in well-organized, teacher-directed classes where expectation, assignments, and goals are clearly identified. This suggests that the traditional lecture model is still relevent for today's adult nursing student at NMTC.

The identification of student similarities relative to learning methods provides guidelines for curriculum development, clinical experience, and faculty assignment. For example, because older students at NMTC prefer teacher-centered instructional situations, they should not be discriminated against in the classroom, the lab, or in the clinical setting. Oftentimes, the assumption is made that because students are older, they are more comfortable

with student-centered learning activities. The findings of this study suggest that perhaps this group of students do not prefer student-centered learning experiences. NMTC faculty can no longer assume that the comfort level of older students in initiating learning activity is significantly different from the comfort level of traditional students.

The very fact that a limited range of learning styles exist within the population under study reflects a lack of diversity of individual differences. This finding is in direct conflict with the findings of a similar study conducted by Seidl and Sauter (1990). Perhaps NMTC's nursing students show limited diversity in their learning styles because they are all enrolled in a "technical" nursing program rather than a "professional" nursing program. Maybe it is because these students, with few exceptions, have only a twelfth-grade level of education or a high-school equivalency education prior to entering the nursing program at NMTC. This lack of self-directedness in NMTC's nursing students could be perceived by some as a negative learning characteristic. Self-directedness is an essential characteristic of the registered nurse.

It is worth noting that students with higher abstract cognitive levels preferred student-centered learning activity more than students with concrete thinking levels, although the difference was not significant. This might indicate that this group of students should be provided with

self-directed learning activity as well as teacher-structured learning activity so that the full range of their needs/concerns will be met.

It would be logical to postulate that the professional development needs of nursing faculty at NMTC do not vary according to years of teaching experience. The increased use of nontraditional modes of instruction by ADN faculty could be the result of the educational level of faculty in that program. Further study might show that the more advanced a faculty member's educational level, the more apt they are to use nontraditional teaching methods. If this were the case, it could be suggested that PN faculty pursue advanced education so that they too would introduce student-centered teaching methods into their curriculum so that the needs of all NMTC nursing students could be met.

Recommendations

The unique learning styles of each individual student should be the foundation of instructional methodologies rather than on the presumed needs of various groups of students. A variety of teaching/learning activities should be implemented in NMTC's nursing programs in an effort to meet the unique needs of all students. This thinking is consistent with the work of learning style theorists who contend that learning is not a function of age but of individual learning style.

Nursing faculty should be cognizant of the need for structure while encouraging and promoting self-direction and autonomy. NMTC's nursing students do appear to prefer teacher-centered structure. They are more comfortable with this type of learning environment. However, faculty have a responsibility to cultivate in students the ability to be self-directed in their learning as this is a highly desired attribute for nurses. Instructional techniques that incorporate independent study, self-paced, and programmed-study methods are appropriate for both PN and ADN students and would encourage students to become self-directed.

The principles of adult development should be of prime consideration when determining the teaching/learning needs of adult students. The life experiences, work experiences, concerns and expectations of these students must be given considerable weight by faculty when designing the instructional situation. Approaches to instructional design that result in permanent, life-long conceptual change must be used for all students.

Research on the relationship between specific instructional techniques, learning and cognitive style has yielded inconclusive results however, research must continue in this area. Educators have only begun to understand the complex concept of cognition even though it has been discussed for some time.

It is recommended that nursing faculty at NMTC have a firm foundation in andragogy. This can best be accomplished by advanced education in nursing and/or higher education as well as workshops/conventions designed for the postsecondary educator. NMTC nursing faculty need to explore alternative methods to increase student participation in the teaching/learning process. Professional development activity is the vehicle by which this exploration process takes place. Faculty should continuously examine their own learning/teaching styles in terms of how it might affect the learning environment of students.

Future research should be directed toward comparing several learning style instruments in order to determine which one best measures the learning style preference of nursing students. Furthermore, the effect of such variables as ethnic background, locus of control, socioeconomic status, health-related work experience, GPA, educational background, cognitive level, learning style, personality style, marital status, gender, and age on the learning preferences of NMTC's ADN and PN students should be i*nvestigated. It is possible that a more rigorous study using a control group and an experimental group will be necessary to isolate variables unique to various groups of NMTC nursing students.

In conclusion, the results of this correlational study will be presented at the weekly faculty meeting in the

nursing department. NMTC's President and the Academic Dean will receive copies of this practicum. Perhaps permission will be granted to present the study findings to all NMTC faculty during the monthly college forum. Lastly, this practicum has served as the starting point for the Major Applied Research Project (MARP) process that is required of all Nova University doctoral students in the Programs for Higher Education.

TABLE 1

Traditional and Nontraditional Teaching Styles of ADN and PN Faculty

	Traditional (structured)		Nontraditional (unstructured)	
Program	ADN	PN	ADN	PN
Size	3	10	3	10
Mean	94.00	93.10	67.00	62.80
SD	6.00	10.04	6.24	12.53
F-Ratio	2.7991		4.0274	
F 2-Tail Prob.	0.2254		0.1114	
T-Value	0.1449		0.5479	
T 2-Tail Prob.	0.8874		0.5947	

Table 2A

Correlation of Years of Teaching to Teaching Style

	Traditional (structured)	Nontraditional (unstructured)
Pearson's *r*	-0.28823	-0.19141

Table 2B

Traditional Teaching Styles of Faculty According to Years of Teaching Experience

Group 1 (0-3 yr), Group 2 (4-10 yr), Group 3 (11-25 yr)

	Test 1		Test 2		Test 3	
Group	1	2	2	3	1	3
Size	2	7	7	4	2	4
Mean	90.5	96.6	96.6	89.0	90.5	89.0
SD	13.44	4.72	4.72	12.94	13.44	12.94
F-Ratio	8.0994		7.5085		1.0787	
F 2-Tail Prob.	0.0574		0.1276		0.7536	
T-Value	-1.1302		1.4373		0.1326	
T 2-Tail Prob.	0.2956		0.1845		0.9009	

Table 3A

Correlation of Students' Age to Traditional and Nontraditional Learning Style

	Traditional (structured)	Nontraditional (unstructured)
Pearson's *r*	0.16339	-0.0731

Table 3B

Learning Styles of Traditional and Nontraditional Students

Group 1 is <= 21 Years Old, Group 2 is >= 22 Years Old

	Traditional (Learning Style)		Nontraditional	
Group	1	2	1	2
Size	17	60	17	60
Mean	81.24	84.05	78.12	78.98
SD	7.949	7.990	7.044	6.278
F-Ratio	1.0104		1.2589	
F 2-Tail Prob.	0.9194		0.5072	
T-Value	-1.2835		-0.4886	
T 2-Tail Prob.	0.2033		0.6265	

Table 4A

Correlation of Students' Learning Style and Cognitive Level

	Traditional	Nontraditional
Pearson's r	0.20725	0.19664

Table 4B

Students' Learning Style According to Cognitive Level

Group 1 is Abstract, Group 2 is Conrete

	Traditional		Nontraditional	
Group	1	2	1	2
Size	7	69	7	69
Mean	91.00	82.61	82.86	78.42
SD	6.5320	7.8276	4.5618	6.4975
F-Ratio	1.4360		2.0288	
F 2-Tail Prob.	0.4262		0.1460	
T-Value	2.7364		1.7580	
T 2-Tail Prob.	0.0078		0.0829	

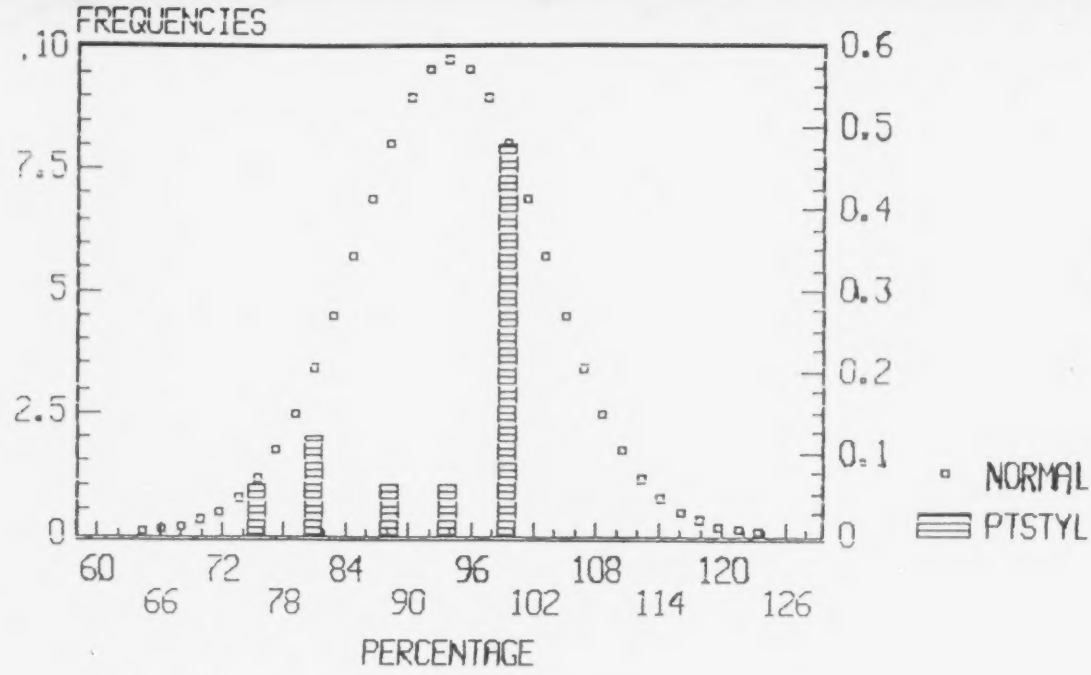

Figure 1A

Traditional Teaching Style
Percentage Scores
of Faculty

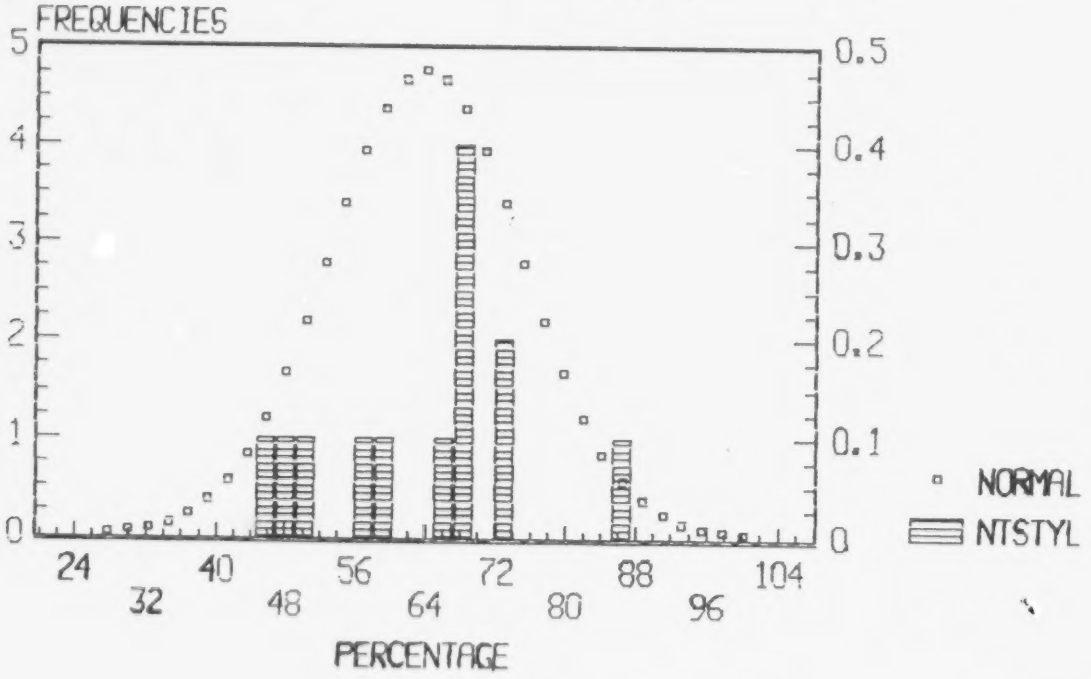

Figure 1B

Nontraditional Teaching Style
Percentage Scores
of Faculty

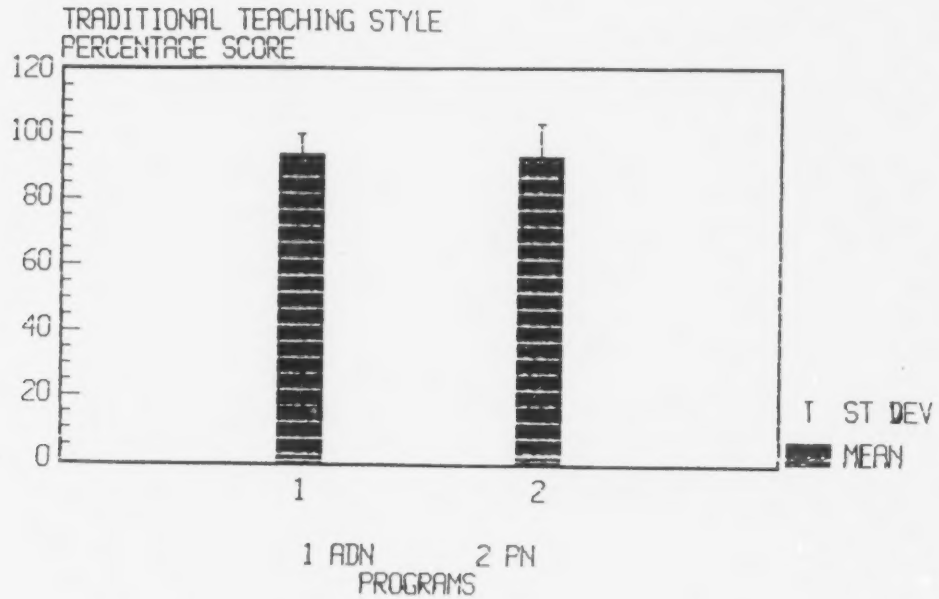

Figure 2A

Traditional Teaching Style Percentage
Scores of PN and
ADN Faculty

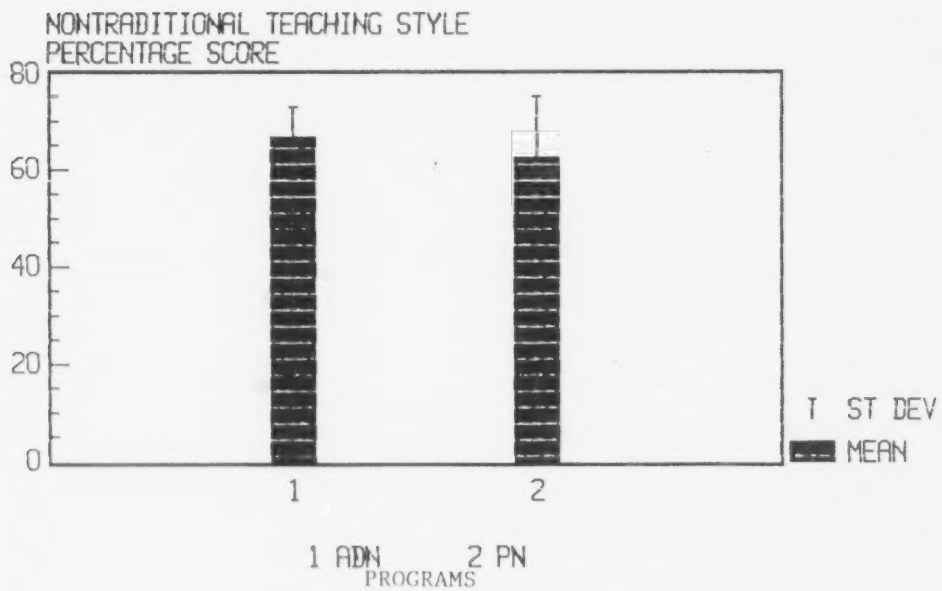

Figure 2B

Nontraditional Teaching Style Percentage
Scores of ADN and
PN Faculty

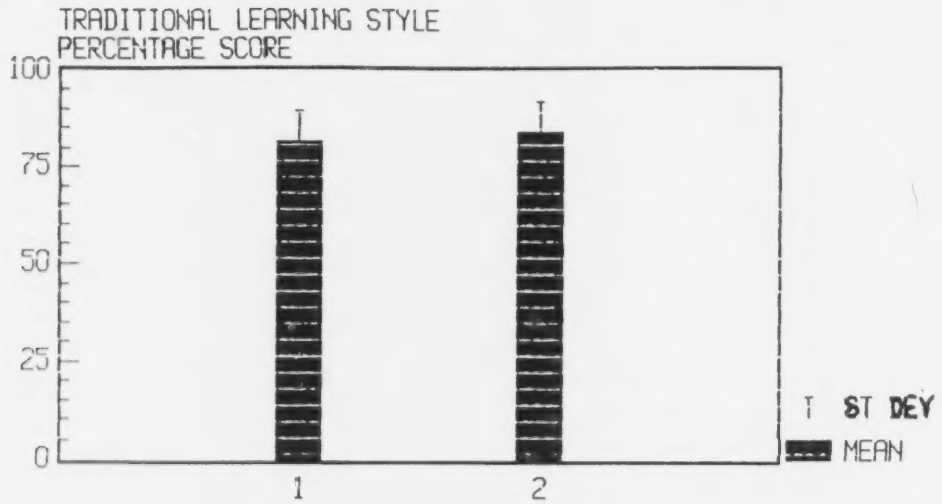

Figure 3A

Traditional Learning Style Percentage Scores
of Traditionally and Nontraditionally
Aged Students

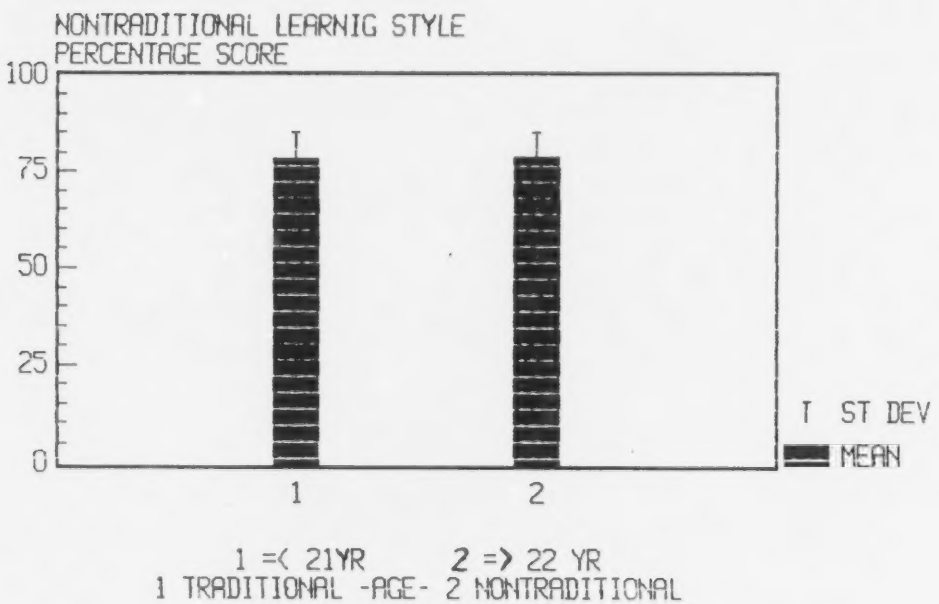

Figure 3B

Nontraditional Learning Style Percentage Scores
of Traditionally and Nontraditionally
Aged Students

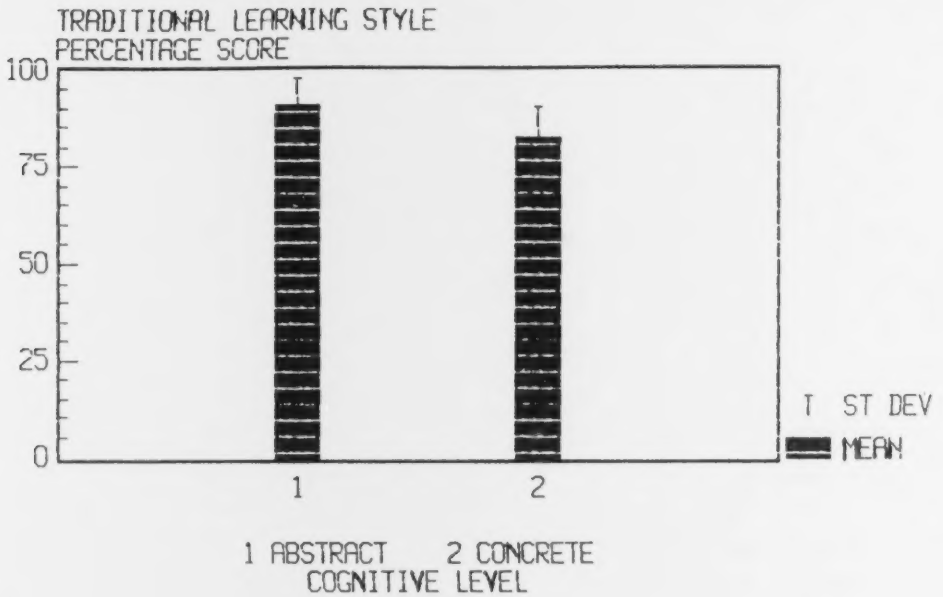

Figure 4A

Traditional Learning Style Percentage Scores
of Students Compared
to Cognitive Level

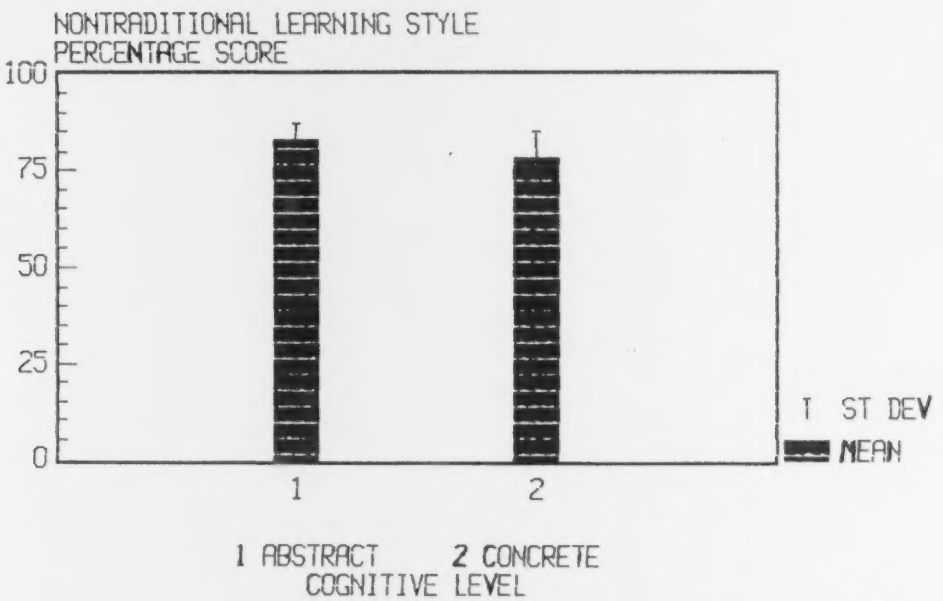

Figure 4B

Nontraditional Learning Style Percentage Scores
of Students Compared
to Cognitive Level

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APPENDIX A

TEACHER FORM AND STUDENT FORM

FACULTY QUESTIONNAIRE

PROGRAM

NUMBER OF YEARS OF TEACHING EXPERIENCE

COURSES TAUGHT

YEARS TAUGHT AT VTI

READ THROUGH THE FOLLOWING LIST OF TEACHING TECHNIQUES USED AND CHECK HOW FREQUENTLY YOU USE THE TECHNIQUE

	FREQUENCY OF USE			
TECHNIQUE	NOT USED	SELDOM USED	MODERATELY USED	FREQUENTLY USED
LECTURE				
DISCUSSION, STUDENT LED				
DISCUSSION, TEACHER LED				
PANEL PRESENTATION				
DRILL SESSIONS				
REVIEW SESSIONS				
SLIDES/FILMSTRIPS/FILMS				
PROGRAMMED INSTRUCTION				
RECITATION				
DEMONSTRATION				
INSTRUCTIONAL TV/VIDEO TAPE				
FIELD TRIPS				
INDIVIDUALIZED INSTRUCTION				
COMPUTER ASSISTED INSTRUCTION				
INDEPENDENT STUDY				
HOMEWORK				

TECHNIQUE	FREQUENCY OF USE NOT USED	SELDOM USED	MODERATELY USED	FREQUENTLY USED
LIBRARY OR RESEARCH PAPERS				
LABORATORY/SHOP				
PRACTICAL EXAMINATIONS				
PEER TEACHING				
WRITTEN EXAMINATIONS				
OTHERS (PLEASE SPECIFY)				

What teaching techniques have been most successful for you to use in which students have learned effectively and you have been pleased with the results? (List techniques in order of their effectiveness)

Please describe a specific illustration of one of your successful teaching experiences: Course: Experience:

Are you trying any type of new or innovative way of teaching a course or courses? Please describe the technique or approach you are using: Course Description of teaching technique:

If you would like to be cited in the report for your innovative teaching appro:ch, fill in the following:

NAME

Student Questionnaire

Part I

Major Program at the Vocational Technical Institute

_____

What is your estimate of your present grade point average. (Based on a 4 point scale) _____

Age _____

On the following questions please circle the appropriate answer.

Sex: Male Female

Number of semesters completed at the Vocational Technical Institute:
1 2 3 4

Are you married? Yes No

Have you ever held a full-time job? Yes No

Are you working now? Full Time Part Time Not Working

Part II

Learning Style

DIRECTIONS: There are many different ways we learn and teachers use a variety of teaching techniques. A number of ways and techniques are described by the items in this survey. Read each item and decide how helpful that particular way or technique is in assisting you to learn here at the Vocational Technical Institute.

There are five possible answers to each statement. The undecided answer should be used only when you have no opinion. You are to mark your answers on the IBM answer sheet accompanying this test instrument. Using the response key below, blacken the space on the answer sheet corresponding to the number that best represents your feelings.

For example:
Blacken 1 if hinders or prevents learning
Blacken 2 if not helpful
Blacken 3 if undecided
Blacken 4 if somewhat helpful
Blacken 5 if extremely helpful

Response Key

1	2	3	4	5
Hinders or Prevents Learning	Not Helpful	Undecided	Somewhat Helpful	Extremely Helpful

Way or technique

1. taking a written test
2. viewing a filmstrip
3. listening to the teacher talk about a topic
4. watching an experiment or shop demonstration
5. listening to a record or tape of a lesson
6. doing homework assignments
7. reading my textbook
8. watching video tape or instructional TV program
9. watching a movie on a class topic
10. asking the teacher questions
11. doing an exercise in a workbook
12. discussing a topic with some members of my class
13. performing an experiment or shop exercise
14. having an actual work experience
15. writing answers to questions in my textbook
16. discussing a video tape or an instructional TV program
17. answering questions of others in the class about a lesson
18. taking notes on what I am reading
19. individualized instruction with teacher
20. giving a report to my class

1	2	3	4	5
Hinders or Prevents Learning	Not Helpful	Undecided	Somewhat Helpful	Extremely Helpful

21. working on a project by myself
22. using the library or reference room
23. working with programmed instruction materials
24. answering the questions the teacher asks
25. working on an experiment or shop exercise with a small group of students
26. receiving good grades
27. visiting a work site
28. taking a practical test
29. working with the computer on gaming or simulation exercises
30. watching my performance on video tape
31. listening to guest lecturers
32. watching/listening to an overhead slide and lecture presentation
33. using the computer for instructional purposes
34. receiving instruction from other students
35. being tutored in academic areas where a deficiency exists
36. meeting with other students in small groups for discussion of academic topics
37. writing a research paper on a particular topic
38. watching a practicing craftsman demonstrate his techniques and skills
39. working with and observing a skilled craftsman in an actual work environment

The following two questions are to be answered in the space provided.

What other learning styles are helpful for you?

What is the most effective and efficient learning style for you?

Introduction to MINDEX™

Mindex is a scientifically designed self-assessment instrument that can give you important, valuable, and useful information about how your mind works. **Mindex** measures your *thinking style*, which is your own unique way of processing ideas and deriving meaning from your experience. Your thinking style has a powerful influence on the way you relate to your world and to other people.

When you understand your own thinking style, you can better appreciate the characteristic way in which you take in information, communicate with other people, learn, solve problems, and make decisions. If you know another person's thinking style, you can communicate with that person more effectively by presenting information in a manner that he or she can best appreciate.

Mindex is a powerful tool that can unlock the doors to higher levels of achievement, personal growth, and human relations. It has many applications in helping people understand themselves and one another, such as in interpersonal communications, personal relationships, counselling, sales, management, team building, and job placement. This knowledge of thinking styles can help us relate to one another more skillfully, by understanding the differences that make us all unique.

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Instructions for Answering MINDEX™

Mindex has 100 carefully formulated statements that deal with various aspects of your thinking process. On the small blank line provided beside each statement, write a number ranging from 1 to 5 depending on the extent to which you feel the statement applies to you. Use the following scale:

1 = not at all or to a very small extent
2 = to a small extent
3 = to a moderate extent
4 = to a great extent
5 = to a very great extent

Consider each statement strictly on its own merits, without regard to other statements or other factors. If you give a high rating to one statement, that does not necessarily prevent you from giving a high number to any other statement. Do not hesitate to use numbers at the extremes of the scale; try to avoid the "middle of the road" choice of 3.

Instructions for Scoring MINDEX

When you have answered all 100 items, refer to the score sheet titled "MINDEX SCORING PROCEDURE." The 20 "boxcar" figures on the score sheet correspond to the letters "A" through "T" that appear beside the various items on the questionnaire. Each boxcar has boxes for 5 answer values, as well as a box for the total of the 5 values.

1. Transfer all of your answer values to the appropriate boxcars. For example, your answer to the first item should go in boxcar "K," because the letter "K" appears beside the first item. The answer to the second item goes in boxcar "T," and so on.

2. When you have all 100 boxcar squares filled in, add up the 5 numbers in each boxcar and write the total in the bottom box.

3. Next, convert each boxcar score from a scale of 1 to 25 to a scale of 0 to 100, by using the conversion table at the bottom of the score sheet. Simply look up your total in the "Total" row and find the adjusted total below it in the "Adjusted Total" row. Write the adjusted total on Page 9, on the blank line that has the same letter ("A" through "T") as the boxcar the total came from.

4. Plot your scores for the four thinking-mode preferences, Red Earth, Blue Earth, Red Sky, and Blue Sky, as dots on the four diagonal scales shown in the square diagram on the profile sheet. Then draw four straight lines that connect the dots into a polygon.

5. The 20 numbers on the Profile Sheet are your scores for the 20 different aspects of thinking style portrayed by **Mindex**.

MINDEX Questionnaire

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1. I am a good planner ..... (K) _____
2. I like to solve puzzles and games that require logical thinking ..... (T) _____
3. I am good at logical reasoning ..... (T) _____
4. I have a good memory for facts and figures ..... (I) _____
5. I am a cheerful, even-tempered person ..... (O) _____
6. I study a new subject thoroughly when I get involved in it ..... (Q) _____
7. I like strong colors, textures, and fabrics ..... (E) _____
8. I avoid expressing "hard-and-fast" opinions in conversation ..... (M) _____
9. I am willing to change my opinions in the face of new information ..... (M) _____
10. I pack a lot of work into a short period of time ..... (H) _____
11. I do not laugh at jokes that put people down or make them feel small ..... (P) _____
12. I am considered open-minded by people who know me ..... (M) _____
13. I like to operate on a time schedule ..... (H) _____
14. I like to get my hands on something to really understand it ..... (E) _____
15. I think in pictures ..... (F) _____
16. I draw diagrams when explaining ideas to other people ..... (D) _____
17. I appreciate the cultural values and customs of other countries ..... (R) _____
18. I am a down-to-earth, intuitive person ..... (A) _____
19. I am a practical-minded, logical person ..... (B) _____
20. I am regarded as having a lot of imagination by people who know me ..... (S) _____
21. I am an "option" thinker ..... (S) _____
22. I ask many questions in conversations with other people ..... (Q) _____
23. I am more "task-oriented" than people oriented in business ..... (B) _____
24. I respect opinions and beliefs that are different from mine ..... (L) _____

25. I set goals as the final step in solving a problem ..... (K) _____
26. I can give an accurate, detailed description of a place or object ..... (I) _____
27. I do not use negative, critical or cynical statements in conversation ..... (O) _____
28. I enjoy analyzing complex subjects ..... (D) _____
29. I enjoy planning and working out complicated schemes ..... (D) _____
30. I pay attention to my emotions and trust them ..... (E) _____
31. I am a punctual person ..... (H) _____
32. I am comfortable with abstract or theoretical subjects ..... (D) _____
33. I prefer to learn something new by having a person show me or teach me ..... (A) _____
34. I speak well of myself and do not put myself down when talking to others ..... (O) _____
35. I use "word-pictures" and visually oriented figures of speech in explaining things ..... (F) _____
36. I have a good musical memory for melodies, etc. ..... (G) _____
37. I express my opinions gently and show respect for the views of others ..... (N) _____
38. I pick up a lot about a person by the sound of his or her voice ..... (G) _____
39. I pick up on subtle "vibrations" from people in most situations ..... (A) _____
40. I spot connections between facts, facto s, and ideas that others may not see ..... (S) _____
41. I have had formal education in scientific and mathematical subjects ..... (J) _____
42. I talk in specifics more than in generalities ..... (I) _____
43. I am good at "brainstorming," i.e., mass-producing ideas ..... (S) _____
44. I can handle life situations that are ambiguous or unresolved ..... (L) _____
45. I understand a situation best by looking at it from the overall perspective ..... (D) _____
46. I am oriented toward philosophical subjects and ideas ..... (C) _____
47. I come up with new or unusual ways of solving problems ..... (S) _____
48. I can take apart and repair household appliances, toys, etc. ..... (J) _____
49. I read non-fiction books and articles on a regular basis ..... (Q) _____
50. I make my decisions based on what "feels" right to me ..... (A) _____

51. I am oriented toward "big picture" thinking ..... (C) _____

52. I have definite goals in my life ..... (K) _____

53. I work best when I'm working toward a specific goal ..... (K) _____

54. I prefer work that involves a step-by-step, methodical approach ..... (B) _____

55. I can perform mental calculations skillfully ..... (T) _____

56. I touch other people frequently and I like to have them touch me ..... (E) _____

57. I am a "people-oriented" person ..... (A) _____

58. I can make others laugh with jokes or funny remarks ..... (P) _____

59. I am comfortable with scientific and technical subjects ..... (J) _____

60. I watch television very selectively, if at all ..... (R) _____

61. I set my own standards for my behavior, rather than respond to peer pressure ..... (R) _____

62. I listen to other people's ideas without prejudging them ..... (M) _____

63. I have a good sense of musical pitch ..... (G) _____

64. I am interested in various "far out" ideas ..... (C) _____

65. I minimize dogmatic statements and over-generalizations in my conversation ..... (N) _____

66. I look for the positive side of a situation ..... (O) _____

67. I am oriented toward literature, the arts, and music ..... (C) _____

68. I think a matter over carefully before forming an opinion about it ..... (M) _____

69. I can easily "tune in" to various sounds in my environment ..... (G) _____

70. I can postpone an opinion on a matter and just "go with it" when appropriate ..... (L) _____

71. I am highly aware of biased or unbalanced points of view in the news ..... (R) _____

72. I am a physically "earthy" person ..... (E) _____

73. I can handle mechanical items like cameras, electronic equipment, etc. ..... (J) _____

74. I define clear-cut outcomes when making agreements with others ..... (K) _____

75. I prefer to read about a subject rather than have someone describe it to me ..... (F) _____

76. I am highly conscious of time ..... (H) _____

77. I accept other people's religious systems and beliefs as valid for them ..... (L) _____

78. I am good at analyzing complicated situations ..... (T) _____

79. I get impatient when trivial matters slow me down ..... (H) _____

80. I am artistically inclined ..... (F) _____

81. I am good at explaining complex subjects clearly and logically ..... (T) _____

82. I appreciate a good joke and can laugh easily ..... (P) _____

83. I look at situations in terms of "shades of grey" rather than as "black and white" ..... (N) _____

84. I approach each new project with the anticipation of success ..... (O) _____

85. I am skilled at getting a complicated or confused situation organized ..... (B) _____

86. I can generalize, conceptualize, use analogies, and explain ideas well ..... (N) _____

87. I prefer to have someone explain a subject to me rather than read about it ..... (G) _____

88. I make my decisions based on concrete facts and logical reasons ..... (B) _____

89. I like to get down to specifics in solving a problem ..... (I) _____

90. I am not aroused by motivational messages that appeal to my emotions ..... (R) _____

91. I am skillful in tracking down the information I need ..... (Q) _____

92. I actively look for facts and information when I have a decision to make ..... (Q) _____

93. I can understand a thing or a situation best if I can visualize it ..... (F) _____

94. I make very few critical or negative value judgments about people and ideas ..... (L) _____

95. I use semantic "qualifiers" in conversation, such as "it seems to me," "so far as I know," etc. ..... (N) _____

96. I am good at work that requires close attention to detail ..... (I) _____

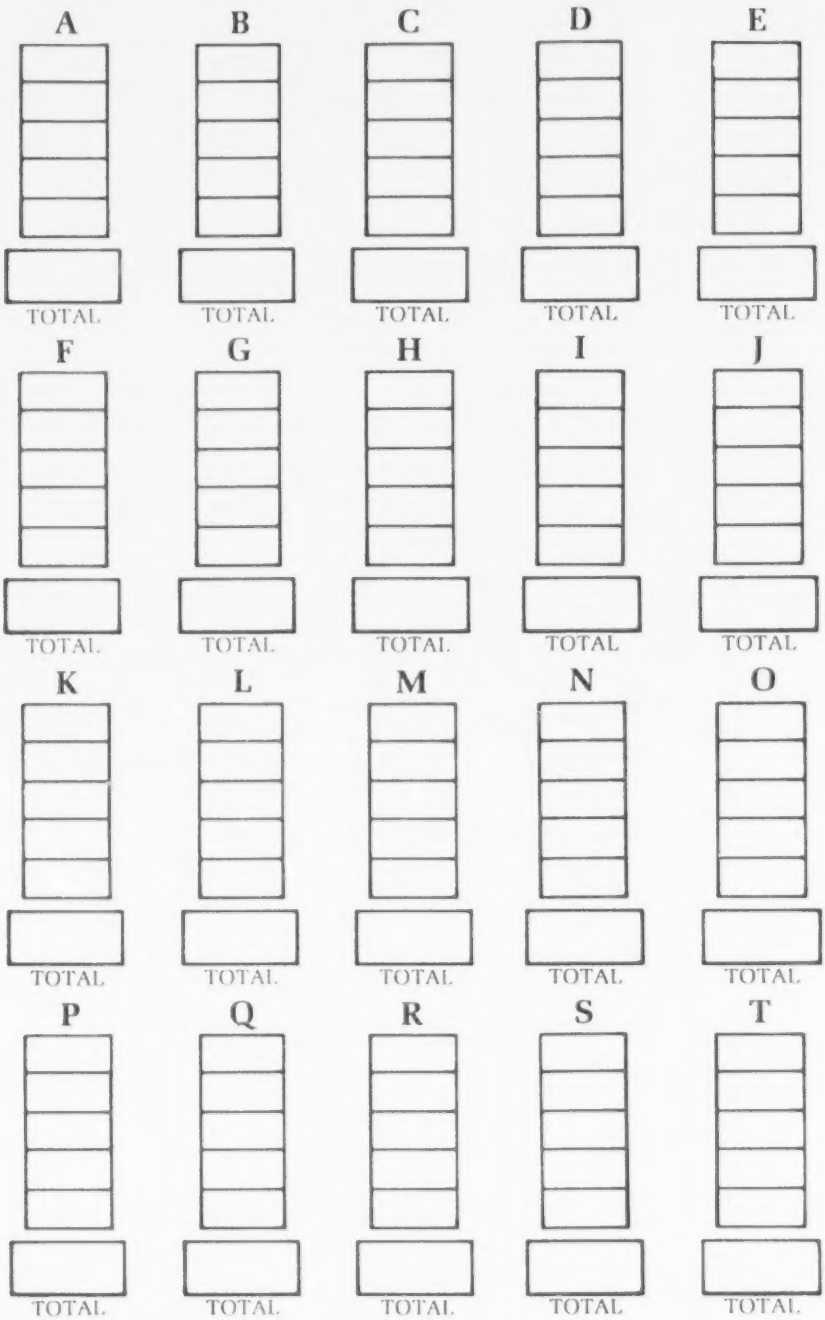
97. I am interested in metaphysical subjects and ideas ..... (C) _____

98. I provide myself with a steady diet of amusing experiences ..... (P) _____

99. I am easily amused by small things ..... (P) _____

100. I can use (or easily learn to use) a personal computer ..... (J) _____

MINDEX™ Scoring Procedure



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CONVERSION TABLE

TOTAL	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
ADJUSTED TOTAL	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100

Your MINDEX™ Profile

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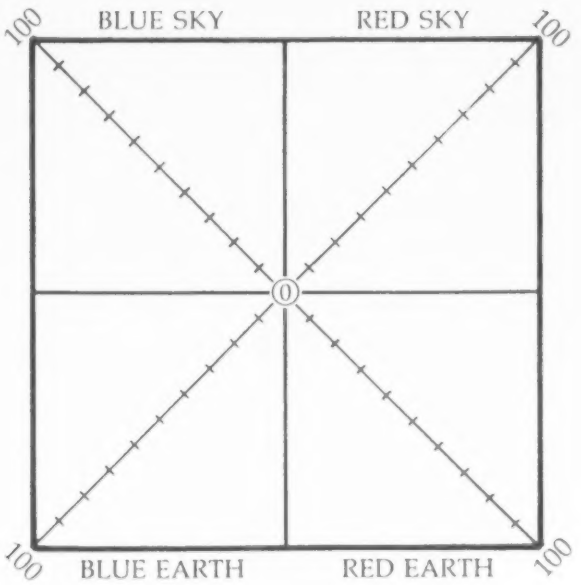
A. RED EARTH ..... _____

B. BLUE EARTH ..... _____

C. RED SKY ..... _____

D. BLUE SKY ..... _____



SENSORY MODE PREFERENCE

E. Kinesthetic ..... _____

F. Visual ..... _____

G. Auditory ..... _____

STRUCTURE PREFERENCE

H. Time Orientation ..... _____

I. Detail Orientation ..... _____

J. Technical Orientation ..... _____

K. Goal Orientation ..... _____

MENTAL FLEXIBILITY

L. Tolerance for Ambiguity ..... _____

M. Opinion Flexibility ..... _____

N. Semantic Flexibility ..... _____

O. Positive Orientation ..... _____

P. Sense of Humor ..... _____

Q. Investigative Orientation ..... _____

R. Resistance to Enculturation ..... _____

THINKING FLUENCY

S. Idea Fluency ..... _____

T. Logical Fluency ..... _____

APPENDIX B

PERMISSION LETTER

UNIVERSITY OF SOUTHERN MAINE

Department of Human Resource Development
College of Education

400 Bailey Hall
Gorham, Maine 04038
(207) 780-5316

April 11, 1991

Norma McKinnon
33 Edgemont Drive
Presque Isle, ME 04769

Dear Norma,

You have my permission to use the "Faculty Survey" and the "Teaching/Learning Survey" contained in Appendix A and B of the final report of my research project which was conducted under Part C of Public Law 90-576 in 1978. You have my very best wishes for this research and for the completion of your doctoral degree from Nova University.

Sincerely yours,

John M. Sutton, Jr.
Professor of Counselor Education

JMS/kb

ERIC Clearinghouse for Junior Colleges

JUN 14 1991